

# Claims

- [c1] A method for bonding a microchannel plate to a dielectric insulator comprising the steps of:
- the microchannel plate and the dielectric insulator are deposited with a thin film consisting of a suitable metal selected for optimum diffusion at elevated temperatures and pressure over compatible exterior faces;
  - the metallized MCP and dielectric insulator are aligned and placed in a bonding fixture and a compression force is applied sufficient for the compatible exterior faces of the MCP and dielectric insulator to initiate a diffusion bonding process at a selected temperature; and
  - the bonding fixture securing the compressed metallized MCP and dielectric insulator is placed in a vacuum heat chamber for accelerating the diffusion bond between the MCP and the dielectric insulator.
- [c2] The method of claim 1 wherein the metal suitable for the deposition of the thin film is selected from the group consisting of gold, silver and copper.
- [c3] The method of claim 1 wherein the dielectric insulator is

a sapphire ring.

- [c4] A microchannel plate body assembly of the type including a microchannel plate suitable for electron amplification comprises:
  - a microchannel plate (MCP) having a bonding surface, and a dielectric insulator unit having a bonding surface compatible with the bonding surface of the MCP; and
  - the bonding surface of the MCP being diffusion bonded to the compatible diffusion bonding surface of the dielectric insulator.
- [c5] The invention of claim 4 wherein the dielectric insulator is a sapphire ring.
- [c6] The invention of claim 4 wherein the compatible surface of the MCP has a thin metallic film deposited thereon prior to bonding of the MCP and the dielectric insulator.
- [c7] The invention of claim 4 wherein the compatible surface of the dielectric insulator has a thin metallic film deposited thereon prior to bonding of the MCP and the dielectric insulator.
- [c8] The invention of claim 6 wherein the thin film includes a metal selected from the group consisting of gold, silver, and copper.

- [c9] The invention of claim 7 wherein the thin film includes a metal selected from the group consisting of gold, silver, and copper.
- [c10] The invention of claim 4 wherein the microchannel plate body assembly is adapted for use in an image intensifier tube.